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SITE SUMMARY AND RECOMMENDATION

The Holy Trinity Cemetery site (EPA ID No. NYN000206698), hereinafter referred to as "the HTC site" or "the site", consists of an area of radionuclide contamination located at a cemetery of approximately 31.5 acres in Lewiston, New York. The area of observed contamination is 2.91 acres; the property is owned by Holy Trinity Cemetery. The area of observed contamination is located in the northernmost portion of the property on a relatively flat and slightly elevated grassy field, as well as on existing roadbeds. There is one building on site, which is utilized both as a residence and cemetery maintenance facility. The HTC site is bordered: to the north and east by Interstate 190; to the south by another cemetery; and to the west by Robert Avenue and a residential area.

In a 1978 U.S. Department of Energy aerial radiological survey, more than 15 properties throughout the region were identified as having elevated levels of radiation above background. It is believed that, in the early 1960s, slag from the local Union Carbide facility was used as fill on the properties prior to paving. The slag contained sufficient quantities of uranium and thorium to be classified as a licensable radioactive source material. Union Carbide subsequently obtained a license from the Atomic Energy Commission (now the Nuclear Regulatory Commission) and the State of New York; however, the slag had been used as fill throughout the Niagara Falls region prior to licensing. Based on the original survey and subsequent investigations, it is believed that the radioactive Union Carbide slag was deposited at the Holy Trinity Cemetery property.

In February 1980, the New York State Department of Health Bureau of Radiological Health and the Niagara County Health Department conducted a radiological survey of the HTC site to identify areas of elevated radioactivity as a result of radioactive slag having been used on the property for fill. The survey was conducted based on information that the slag used at the cemetery was from the same source used at two other locations in nearby Niagara Falls, which had been identified by the NYSDOH as containing elevated levels of radioactivity. During the survey, cemetery personnel showed NYSDOH a slag pile located near the caretaker's garage in the western portion of the property. Cemetery personnel stated that this slag was used as fill for the cemetery roads throughout the property.

Additionally, the slag was used as fill for the base of two proposed roadbeds that extended approximately 500 to 600 feet from the caretaker's garage northwest toward Robert Avenue. At the time of the survey, the construction of these roads had been abandoned. The underlying slag base was covered with an unknown amount of soil and was left as an open field. Using an Eberline PRM 7 radiation meter, radioactivity of the slag pile was measured at 250 $\mu\text{R/hr}$; readings along cemetery roads ranged from 5 $\mu\text{R/hr}$ (i.e., background concentration) to 30 $\mu\text{R/hr}$. Readings along the abandoned roadbeds ranged from 200 $\mu\text{R/hr}$ to 400 $\mu\text{R/hr}$. Samples of the slag were collected as part of the investigation; laboratory analyses of the samples indicated detectable concentrations of potassium-40, uranium-235 and -238, radium-226, thorium-232, and one other isotope.

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In October 2006, the New York State Department of Environmental Conservation and the Niagara County Health Department conducted a site visit at HTC. At that time, the slag pile that previously had been observed near the caretaker's garage was no longer on site; the current caretaker had neither knowledge of the slag pile, nor what happened to it. The caretaker also indicated that children living nearby use this area for recreation. Since the 1980 NYSDOH site investigation, trees had grown through the abandoned slag roadbeds, pushing the slag to the surface. As part of the site visit, NYSDEC conducted a radioactivity survey with an Exploranium GR-135. Readings taken while walking along the roadbed indicated levels of 200–450 $\mu\text{R/hr}$ at waist height and a surface contact reading of 450–570 $\mu\text{R/hr}$; a contact reading of 700 $\mu\text{R/hr}$ at exposed slag near a tree was documented. NYSDEC collected four samples of the slag; the samples were analyzed for isotopic uranium and isotopic thorium, and underwent gamma-ray spectroscopy analysis. Laboratory analytical results indicated the presence of uranium-238/234 ranging from 114 to 1,664 pCi/g and thorium-232 ranging from 114 to 898 pCi/g.

In May 2007, NYSDEC visited the site to identify contamination in an on-site debris pile using gamma-ray spectroscopy. A 5-minute static reading was taken; radium-226 was the only nuclide identified. An additional similar analysis was conducted on one of the roadbeds, confirming the presence of thorium-232.

During a reconnaissance performed by the NYSDOH and NYSDEC in July 2013, screening activities showed radiation levels at the HTC site along the roadway and along the back roadway leading to offsite with radiation levels up to 51 $\mu\text{R/hr}$ in the roadway with the pressurized ion chamber (PIC) and up to 50,000 cpm with the sodium iodide (NaI) 2x2 detector.

On December 12 and 13, 2013, WESTON personnel collected a total of 14 subsurface soil samples and three slag samples from the HTC property. Soil samples were also collected from two locations suspected to be outside the influence of the area of observed contamination to document background conditions. At each sample location, soil samples were collected directly beneath slag material; at locations where a radioactive layer was not visually observed to be present, the soil sample was collected at the equivalent depth interval. The slag samples each consisted of one single piece of slag.

The soil samples were analyzed by TestAmerica Laboratories for TAL metals analysis; isotopic thorium, isotopic uranium, radium-226, and radium-228 by alpha spectroscopy; and radioisotopes by gamma spectroscopy. The slag samples were analyzed for the same parameters, with the exception of TAL metals analysis. One soil sample for TAL metals analysis was designated as a MS/MSD sample for QA/QC purposes. One rinsate blank was collected to demonstrate adequate decontamination of non-dedicated sampling equipment (e.g., cutting shoe). Analytical results indicate concentrations of radionuclides found in all slag samples and seven

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soil samples (including the field duplicate) to be significantly higher than at background conditions.

On May 1, 2014, WESTON personnel collected radon and thoron concentration measurements from locations on and in the vicinity of the HTC site. At the selected locations in background areas, above the source material, and off the source area, radon and thoron concentration measurements in pCi/L were collected with RAD7 radon detectors. The radon and thoron measurements were collected at heights of one meter above the ground surface. The measurements included uncertainty values, which were taken into account to calculate adjusted concentrations for evaluation of observed release in the air migration pathway. There were no radon or thoron concentrations that exceeded the site-specific background, nor were there any adjusted concentrations that equaled or exceeded a value two standard deviations above the mean site-specific background concentration for that radionuclide in that type of sample (i.e., there is no evidence of an observed release to air from site sources).

An HRS QuickScore (Version 3.0.5) analysis of the HTC site was conducted on the basis of observed contamination for the soil exposure pathway, Level 1 soil exposure for the on-site residents and workers, and potential to release to the surface water and air migration pathways. This analysis results in a site score of 5.20, which is below the 28.5 minimum score required for placement on the NPL.

Based on an evaluation of the above conditions, a recommendation of **NO FURTHER REMEDIAL ACTION PLANNED (NFRAP)** is given for the Holy Trinity Cemetery site.